glucina, I am not aware that this method has ever been suggested to separate glucina from alumina by boiling a solution, nearly neutralized with sodium carbonate, with sodium acetate. It is a known fact (see Graham-Otto's Anorganische Chemie, by Michaelis, iii, 2 Hälfte, p. 694) that from a solution of beryllium chloride the glucina is precipitated on boiling with sodium acetate.*

Dr. Winkler does not state that he has tested his so-called *alumina* for its purity, which is unfortunate, or he would have found that a slight trace of it might have been present, but that the precipitate was nearly pure glucina. *There can be very little doubt that the Ehrenfriedersdorf and Stoneham mineral are identical in composition.* There is also a larger percentage of ferric oxide in Dr. Winkler's analysis than found by me. Might this not have come from the molybdic acid which he used? The ammonium molybdate—prepared from Merk's molybdic acid—which I use contains in 100^{cc} 0.002 grms. ferric oxide. As I used measured quantities, a corresponding amount of ferric oxide was deducted.

UNIVERSITY OF PENNSYLVANIA, *Philadelphia, October 17, 1884.*

Notes on the Natural Bridge of Virginia. By Charles A. Ashburner.

(*October 3, 1884; see page 690.*)

During a recent trip to Virginia (September 2 to 6), I visited the Natural Bridge, and although in possession of the tourist guide book of the locality (edition of 1884) and the admirable articles published by Major Jed. Hotchkiss in "The Virginias," I failed to obtain certain information relating to the bridge which would be of special interest to the topographer and geologist. Some of the observations which I made, although of a general character, may be of interest to members of the American Philosophical Society.

The bridge is undoubtedly the remnant of the top of a cave which was

* In order to show the value of the method used by Dr. Winkler for the separation of alumina and glucina, a quantity of beryllium carbonate was dissolved in hydrochloric acid, evaporated to dryness, diluted with about 150^{cc} of water, nearly neutralized with sodium carbonate, then about 2 grams of sodium acetate were added and the solution heated. At about 80° it became turbid, and after two hours boiling a considerable precipitate had formed, which was filtered off and washed. It was dissolved in dilute hydrochloric acid, then sodium hydrate was added to redissolve the precipitate, then it was diluted with much water and gave on boiling beryllium hydrate, which after ignition weighed 0.0855 grams. The filtrate from the precipitate produced by sodium acetate was precipitated by ammonia and gave 0.2705 grm. This shows that 24.3 per cent were precipitated by boiling, and that the method is worthless for the separation of glucina from alumina. By a greater dilution and a more strict neutralization perhaps all the glucina might have been precipitated.

probably formed long before the Luray Cavern, which is excavated out of the same limestone formation. The bridge seems to be located in the centre of a gentle basin or syncline in the strata, which may account for the roof of the ancient cavern being left at this special point. The height of the bridge has evidently been much augmented by a lowering of the bed of Cedar creek through the agency of chemical and mechanical erosion after the destruction of the original cavern. The height of the cavity at the point where the bridge now exists being in consequence very much less than the present height of intrados of the bridge arch.

The elevation above ocean level of the railroad track at Natural Bridge Station on the Shenandoah Valley R. R., is 760 feet, and the elevation of Cedar creek under the north face of the bridge arch is 915 feet, as determined by two independent lines of barometric levels which I ran from the railroad station to the bridge. The height of the crown of the arch on the north side at the "Lookout Point" is 188 feet above the creek, measured with a cotton twine, which was the only line of the required length which could be obtained. The same measured by barometer (Short and Mason aluminium aneroid), was determined as 186 feet. Neither of these methods of measurements are sufficiently exact to permit of a final statement, but are of interest in the absence of more definite data. The thickness of the arch under the crown on the north side is approximately 46 feet, and on the south side 36 feet.

Much has been written and published about this Natural Bridge since the appearance, a century ago, of the Travels of the Marquis de Chastellux in North America, in 1780–2, but there appears to be a lack of a complete description of the bridge and its surroundings which is readily available, which would prove of special value to the topographer and geologist.

Stated Meeting, November 7, 1884.

Present, 18 members.

President, Mr. FRALEY, in the Chair.

Col. Ludlow, Dr. Randolph, and Mr. Dickson, new members, were introduced to the presiding officer and took their seats.

Letters of acknowledgment were received from the Royal Academy at Madrid (XVI, i, 113, 114); the Society of Antiquaries of London (415); and the Maine Historical Society (115).

A letter of envoy was received from the Meteorological Office, Royal Society, London.